

*um* they are linear. In Janchen's paper (1) the cotyledons were described as linear in *Helianthemum*, and, later, in an emended description of the genus in Engler's Pflanzenfamilien (2) he states that the cotyledons are long-elliptic. Apparently from these descriptions the difference in shape of the cotyledons would seem to be well marked. However, cotyledons of many seedlings of *Helianthemum suffrutescens* were examined in the field and it was found that they varied in shape from linear to elliptic or occasionally wider. Some of the cotyledons were united at the base and others were not. These facts indicate that in this group the shape and character of the cotyledons are not satisfactory criteria for separating genera.

The absence of stipules was formerly considered both by Spach (4) and Janchen (1) as important in the generic segregation of *Crocanthemum*. Later, a species from the Gulf States, *C. stipulatum*, was described by Janchen and this character lost its significance in the separation of old and new world groups.

Further study may reveal well defined differences between *Helianthemum* and *Crocanthemum* but for the present the new world species are referred to the genus *Helianthemum*.

November 22, 1938.

#### LITERATURE CITED

1. JANCHEN, E. Bemerkungen zu der Cistaceen-Gattung *Crocanthemum*. Oesterreichisches Botanisches Zeitschrift 71: 266-270. 1922.
2. ————. Cistaceae in Engler & Prantl, Natürlichen Pflanzenfamilien 21: 305-307, 308-310. 1925.
3. SPACH, E. Conspectus Cistacearum. Annales des Sciences Naturelles Ser. II. 6: 370. 1836.
4. ————. Les Cistacées. Histoire Naturelle des Végétaux, Phanerogames 6: 15-16, 95-96. 1838.

## A NEW SPECIES OF CIRSIUM FROM CALIFORNIA

HELEN K. SHARSMITH

### *Cirsium campylon* sp. nov.

Herba perennis, erecta, crassa, pallido-viridis, hydrophila, 6-21 dm. alta; e caudice caules vulgo solitarii, lanati vel arachnoidei, indumento tarde deciduo, sparse glanduloso-papillati; folia lanceolata, subtus albo-lanata supra glabrescentia; laminae pinnatifidae, sinibus rotundis, segmentis irregulariter 3-4-lobatis, lobis saepe quam longis latioribus, in aculeis crassis, stramineis 5-15 mm. longis terminatis; folia basalia 60-70 cm. longa; folia caulina superiora 20-40 cm. longa; capitula cernua, 2.5-3 cm. alta; involucri bractee anguste ovatae, valde recurvatae, coriacea, 20-30 cm. longae, subter medium latissimae, ad mediis marginibus undulatae crosulatae, attenuatae, sulcatae, aculeo crasso 3-5 mm. longo terminatae; corolla alba, 18-22 mm. longa; microspora 31-33  $\mu$  diametro; styli rami 4-6 mm. longi.

Erect, coarse, pale green, hydrophilous perennial, 6-21 dm.

in height, 3-9 dm. in spread; caudex woody, thick, bearing fascicled roots; cotyledons subpetiolate, oval, 10-12 mm. long, 5-7 mm. wide, glabrous; stems mostly solitary, 2-5 cm. in diameter at base, grooved longitudinally, lanate, arachnoid with age, slightly glandular-papillate, fistulous, leafy throughout, bearing floriferous branches at the nodes; leaves lanceolate, lanate beneath, arachnoid with age, the veins not or only weakly glandular-papillate, upper surface less densely arachnoid and more glandular-papillate, subglabrate with age; stomata 29-35 microns; blades shallowly to deeply pinnatifid into irregularly 3 or 4-lobed segments with rounded sinuses, the posterior portion of each segment directed upward 90 degrees from the midrib, the lobes of the segments often broader than long, ovate, their midribs terminated by stout, often brownish-based, stramineous prickles 5-15 mm. long, lateral prickles small; basal leaves 60-70 cm. long, the lower third of blade with small lyrate pinnae; cauline leaves gradually reduced above, the uppermost 20-40 cm. long, all sessile and decurrent with prickly, auriculate bases; inflorescence bracteate, paniculate, the heads numerous; larger bracts of the inflorescence 8-10 cm. long, reduced upwards, lower portion with stout marginal prickles up to 25 mm. long, nearly entire above the middle; heads strongly nodding, 2.5-3 cm. long, 4-4.5 cm. broad; involueral bracts in 6 to 8 (or 10) series; outer bracts strongly recurved, narrowly ovate, channelled, coriaceous, 20-30 mm. long, 6-8 mm. wide, margins near middle undulate and ciliate or erose, basal half of bracts greenish, smooth, glabrous, upper half tapering, light green to somewhat reddish, dull, sparingly glandular pubescent to glabrate, tipped with a stout prickle 3-5 mm. long; inner bracts progressively smaller and more erect, plane, horny, pale green, shining, the apical portion spatulate dilated, recurved, undulate margined, subcoriaceous, subglabrate, acute and weakly prickle tipped; corolla white, 18-22 mm. long, the tube 6-8 mm. long, the throat cylindric, 6.5-7 mm. long, the lobes subequal, 3.5-4 mm. long, somewhat spreading, the margins slightly inrolled, the apex acute and hooded; filaments 3-8 mm. long, glandular pubescent; anthers pink, 6-8 mm. long; pollen grains regular, 31-33 microns in diameter; style white, 21-30 mm. long, the branches linear, obtuse, erect, appressed, 4-6 mm. long; achenes 4 mm. long, 2 mm. wide, angled at truncate apex, dark brown, shining; pappus bristles 30 to 40, tawny, 8 to 14 of the bristles clavellate tipped, 12-13 mm. long, 2-4 mm. longer than the others.

Type. In a dense colony along margins of El Puerto Creek near its junction with Adobe Creek, Arroyo del Puerto, Red Mountains, Mount Hamilton Range of the South Coast Ranges, Stanislaus County, California, altitude 1700 feet (515 meters), May 24, 1936, *H. K. Sharsmith 3761* (Herb. Univ. Calif., no. 610761, inflorescence, no. 610762, leaf); isotypes at Gray Her-

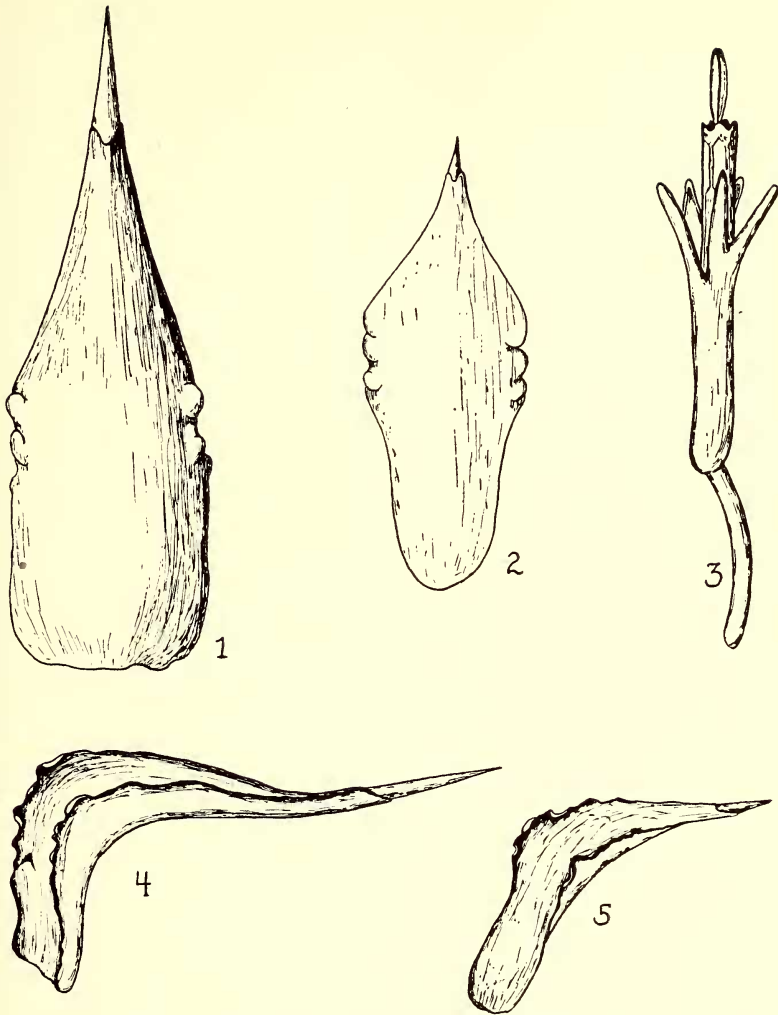


FIG. 1. Comparative drawings of *Cirsium campylon* and *C. fontinale*: 1, involucre bract of *Cirsium campylon*, outer surface,  $\times 3$ ; 2, involucre bract of *C. fontinale*, outer surface,  $\times 3$ ; 3, floret of *C. campylon*,  $\times 3$ ; 4, involucre bract of *C. campylon*, side view,  $\times 3$ ; 5, involucre bract of *C. fontinale*, side view,  $\times 3$ .

barium and Royal Botanic Gardens, Kew.

Range. Mount Hamilton Range of the South Coast Ranges of California, altitude 1000–2500 feet (300–750 meters). Forming dense but isolated colonies in moist, sandy soil along edges of small, perennial streams, all known localities occurring in areas of serpentine rock. Flowering April to September.

The writer is grateful to the curators of the following herbaria for the loan of specimens: University of California (UC); California Academy of Sciences (CA); Vegetation Type Map Herbarium of the California Forest and Range Experiment Station, Berkeley (VTM).

Specimens examined. Stanislaus County: Arroyo del Puerto, *H. K. Sharsmith 3941* (topotype, UC); tributary to Adobe Creek, *H. K. Sharsmith 3602* (UC), *Carter & Morrison 3099* (UC). Santa Clara County: Colorado Creek, *H. K. Sharsmith 3891, 3940* (UC), Metcalfe road northeast of Coyote, *H. K. Sharsmith 3953, 3954* (UC), *C. M. Belshaw 2279* (VTM); Coyote Creek, *Eastwood & Howell 4517* (CA, UC).

The naming of an additional species in a large, polymorphic and cosmopolitan genus demands particular caution. The difficulties, however, are somewhat mitigated in this instance, since *Cirsium campylon* falls into an isolated section of the genus, *Dermatolepis* Petrak (Die nordamerikanischen Arten der Gattung *Cirsium*. Bot. Centralblatt Beiheft 35: 223-567. 1917). This section was erected for a single species, *Cirsium fontinale* (Greene) Jepson (Fl. W. Middle Calif. 505. 1901), known only from the Crystal Springs area of San Mateo County in the outer South Coast Ranges of California. Petrak characterizes *C. fontinale* as a relict occupying a highly isolated position not only among American species of *Cirsium*, but within the genus as a whole. *Cirsium fontinale* var. *obispoensis* J. T. Howell (Lfts. West Bot. 2: 71. 1938), has been described recently from specimens collected in San Luis Obispo County (Chorro Creek, *Eastwood & Howell 2218*, CA, type, UC, isotype; Prefumo Canyon, *Eastwood & Howell 5917*, CA, UC) and is thus widely separated from the Crystal Springs area occupied by the originally described phase of *C. fontinale*.

The distinguishing features of the section *Dermatolepis*, as given by Petrak, are an arachnoid and glandular-papillate indumentum, a somewhat unequally five-lobed corolla, and involucrel bracts which are ample, coriaceous, reddish, recurved, broadened above the middle, abruptly acute, and tipped with a stout but short prickle, the inner bracts progressively narrower, spatulate-dilated, scarious, and erect. Petrak considers the involucrel bracts of *C. fontinale* to be highly distinctive, and more nearly comparable to those of *Carduus platylepis* Sauter of the old world than to those of any North American species of *Cirsium*. *Cirsium fontinale* var. *obispoense* fits into Petrak's general description of the section *Dermatolepis*, and it requires only minor amplification of the sectional characters to include *C. campylon*.

The double indumentum and unequally five-lobed corolla are common to both *Cirsium campylon* and *C. fontinale* and there is likewise a similarity in general habit. The involucrel bracts, which are the most commonly used basis for specific differentia-

tion within the genus, are fundamentally similar in the two species, but there are certain technical differences. The name *C. campylon*, suggested by Dr. W. A. Setchell, is descriptive of the bracts in this species, which are "curved like a bow." The following key indicates the salient differences between the two species, and amplifies the section *Dermatolepis* to include *C. campylon*.

Stems mostly single from caudex, green; heads strongly and permanently nodding; outer involucrel bracts green, strongly recurved, channelled, coriaceous, 20-30 mm. long, widest below middle, upper half tapering, tipped with a 3-5 mm. prickle; style branches 4-6 mm. long	<i>C. campylon</i>
Stems mostly 3-5 from caudex, reddish; heads somewhat nodding, usually erect at maturity; outer involucrel bracts reddish, moderately recurved, plane to somewhat channelled, subcoriaceous, 15-20 mm. long, widest above middle, abruptly acute, tipped with a 1-2 mm. prickle; style branches 3-4 mm. long	<i>C. fontinale</i>

Minor differences occur between *Cirsium campylon* and *C. fontinale* in size, pubescence, leaves, and flowers. In a number of these characters *C. fontinale* var. *obispoense* approaches *C. campylon* rather than typical *C. fontinale*, although in involucrel bracts the variety *obispoense* is definitely aligned with *C. fontinale*. *Cirsium campylon* reaches and sometimes exceeds six feet in height, typical *C. fontinale* averages and seldom exceeds four feet, and *C. fontinale* var. *obispoense* may reach six feet. Most herbarium material of the typical phase of *C. fontinale* gives an erroneous impression of small size, for the sheets consist almost entirely of depauperate plants. Greene's original description of *C. fontinale* (*Cnicus fontinalis* Greene, Bull. Calif. Acad. Sci. 2: 151. 1887) mentions the height as two feet, and Petrak describes the plants he cites as one to two feet tall. In regard to the double indumentum, the woolly component predominates in *C. campylon*, and the glandular-papillate component in the typical phase of *C. fontinale*, although *C. fontinale* var. *obispoense* may be as lanate as *C. campylon*. Minor differences in shape and size of the leaves occur in the two species. The lobes of the segments are ovate and the sinuses rounded in *C. campylon*, whereas the lobes are triangular and the sinuses angled in typical *C. fontinale*; also *C. campylon* has larger basal leaves. *Cirsium fontinale* var. *obispoense* again approaches *C. campylon* rather than typical *C. fontinale* in these features. The prickles on the bracts of the inflorescence are considerably larger in *C. campylon* than in either typical *C. fontinale* or *C. fontinale* var. *obispoense*. There are several minor differences in flower structure, particularly as to style branches, which are usually partially included in *C. campylon*, and exerted in typical *C. fontinale* and *C. fontinale* var. *obispoense*.

The heads of *Cirsium campylon* are conspicuously drooping on limp peduncles while those of *C. fontinale* nod only slightly and



are usually erect at maturity. The extent of this mutant condition of the heads can be determined satisfactorily only in the field.

*Cirsium campylon* and *C. fontinale*, as known, are entirely restricted to areas of serpentine rock, and grow only in the boggy soil of springs or along the margins of perennial streams. Geographically, there is the width of the Santa Clara Valley and the eastern slope of the outer South Coast Ranges between the most proximate colonies of *C. campylon* and the typical phase of *C. fontinale*. Thus *C. campylon* is subjected to a more arid, interior climate, with lower average precipitation and less fog, than is typical *C. fontinale*. About two hundred miles south are the two known localities of *C. fontinale* var. *obispoense*, with climatic conditions approximating those of the species proper. Such facts, together with morphological features, suggest that these two highly localized, endemic species arose from a common stock early in the history of the genus in western America, and that climatic and edaphic factors played a considerable part in their segregation and ultimate extreme localization.

State College of Washington, Pullman,  
February 10, 1938.

## A REALIGNMENT OF THE PANICUM THERMALE GROUP

HAZEL M. SCHMOLL

While attempting to put in order material of the genus *Panicum* in the Herbarium of the Field Museum, considerable morphological variation and distributional discontinuity were noted in specimens referred to *Panicum thermale* Bolander. Reference to the original description of this species and to treatments in various manuals did not clarify the situation. A further study of the group was then suggested by Dr. Julian A. Steyermark of the Field Museum to whom the author is much indebted for criticisms and suggestions. Material was borrowed from the following herbaria: Gray (G), University of California (UC), United States National (US), Field Museum (F) and Rocky Mountain (RM). The writer is grateful to the curators of these herbaria, and especially to Dr. Paul C. Standley of the Field Museum.

As a result of this study it was found that *Panicum thermale* Bolander as currently interpreted is really a complex group consisting of three species and two varieties. Typical *P. thermale* apparently occurs only in the hot springs region of Sonoma and Napa counties, California, while the other species occur near Mount Lassen, California, and in the Rocky Mountains.

The outstanding character which separates the Pacific Coast species of this group from those of the Rocky Mountains is the structure of the panicles. Those of the Pacific Coast species are usually narrower than long, with upright branches, the lower of